

REMARKS

Reconsideration of this Application, and the rejection of claims 20-28 are respectfully requested. Applicants have attempted to address every objection and ground for rejection in the Office Action dated May 20, 2003 (Paper No. 14) and believe the Application is now in condition for allowance. The claims have been amended to more clearly describe the present invention.

Claims 20-28 stand rejected under 35 U.S.C. 112 as being indefinite. The Examiner requests clarification of lines 10 and 19 in claim 20. In response, Applicants amended claim 20, line 10 to recite “impregnating each of the annealed planar toroids by a binding material” and amending line 19 to recite “impregnating each of the annealed column-like toroids by a binding material”. Applicants further amended claim 20 to clarify that the opposite but-end surfaces of each of the column-like toroids are attached to the plate-like elements.

The Examiner questions whether FIG. 1 is in compliance with claims 23 and 24. Claim 23 calls for “several amorphous strips are wound having different widths, the total width of the strips being equal to the desired height of the plate-like element.” Support for this claim can be found in FIG. 1 and the first page of the detailed description which provides that each of the plates 14 and 16 is a toroid, and is made of amorphous ribbons 22 wound about a central hole 23 to form the planar toroid. Applicants further discuss with reference to FIG. 5 in the specification that to manufacture transformers of various power that the toroid can be produced by winding the strips of different widths, the total width of the strips being

equal to a height of the toroid, as recited in claim 23, and clearly shown in the top perspective view of the claimed transformer. For these reasons, withdrawal of the §112 rejection of claim 20 is respectfully requested.

The Examiner states that with respect to claims 23 and 24 that the limitation "...set amorphous ribbon strips" is indefinite due to insufficient antecedent basis for this limitation in the claim. Applicants believe that the limitation that the Examiner is referring to is located in claim 26. Accordingly, Applicants amended claim 26 to define the "amorphous ribbon strips" as "amorphous strips" in line 2. For this reason, withdrawal of the §112 rejection is requested, or clarification of the rejection with respect to claims 23 and 24.

Claims 20-28 stand rejected under 35 U.S.C. 103(a) as being obvious over Lisin et al. (U.S. Patent No. 4,338,657), in view of Wakeling et al. (EP0 151 048), and further in view of Poulsen (U.S. Patent No. 5,168,255). Applicants respectfully traverse the rejection because the cited references, taken alone or in combination, do not disclose or suggest, among other things, "forming each of the impregnated column-like toroids with a radial slot extending along the height of the column-like toroid and filled with an insulating material...[and] attaching opposite butt-end surfaces of each of the column-like toroids to the plate-like elements, respectfully, and arranging the column-like toroids in a spaced-apart parallel relationship, such as to form the magnetic circuit of the transformer as a spatial symmetrical structure about a central axis of the transformer presenting the closed magnetic circuit for magnetic flux propagation therethrough..." as now recited in amended claim 20.

Lisin is directed to a high-voltage transformer-rectifier device that includes a step-up three-phase transformer. Three vertical stacks 7 of closed cores 9 are insulated from one another and secured in an insulating frame 8. The transformer also includes a secondary winding 2 and a primary winding 1 (See the Abstract). As illustrated in FIG. 2, the insulating frame 8 has three concave faces formed by dielectric cylinder segments 14 with transverse slots 15 (FIG. 1) for the toroidal cores 9 carrying the sections 10 of the secondary winding 2. However, Lisin does not disclose or suggest a closed magnetic circuit for magnetic flux propagation therethrough. Rather, Lisin uses separate toroidal closed magnetic cores that each carry a coil block. In addition, Lisin does not disclose or suggest that the core of the transformer has a radial slot filled with an insulating material, but instead teaches slotted dielectric cylinder segments 14 that are used for supporting the toroidal cores 9.

Wakeling et al. discloses a magnetic core 1 for an electrical induction apparatus that includes spaced apart yokes 5 and 9 that are each formed of wound magnetic strip material 10 and legs 2-4 interconnecting the yokes 5 and 9. The legs 2-4 are formed of at least substantially planar layers of magnetic material and are interleaved at their ends with the wound magnetic strip material 10. (See the Abstract). Each of the core legs 2-4 are staggered, or have two different lengths so that when laminae which form the core legs 2-4 are placed against each other a plurality of slots 13 are formed at each end of each of the legs 2-4 (pg. 5, lns. 24-30). That is, the slots are provided by end portions of core strips for assembling the legs 2-4 and the yokes 5-9. Wakeling does not disclose or suggest a radial slot extending along the height of the column-like toroid. That is, Wakeling does not teach a

radial slot extending along the height of the column-like toroid to decrease losses and prevent high voltages from being induced into the windings of the toroids, as in the present invention.

(See Applicant's Specification pg. 12, lns. 5-7).

Poulsen discloses a three phase transformer that includes three frame shaped winding assemblies that each contain primary and secondary windings. Two of the assemblies are substantially identical and juxtaposed to form a center leg having substantially circular cross section, and a third winding assembly surrounds the other two assemblies. The three winding assemblies are interlinked by hollow, cylindrical cores wound from a ferromagnetic strip material. (See the Abstract).

Poulsen discloses an essentially different transformer configuration from the present invention, and does not disclose or suggest a process of impregnation applied to a core prior to the slotting of the core and mounting of a coil block thereon. Rather, Poulsen discloses that the mechanical strength and dielectric properties of the assembly may be improved by means of impregnating with varnish or encapsulating the coil assembly in a suitable casting resin after completion of the assembly. (Col. 3, lns. 47-58). Poulsen further teaches that during the process of unwinding after annealing it is important not to re-introduce mechanical stresses in the core material, and that it is preferable to unwind the pre-wound core from the inside in order to reproduce exactly the original curvature of the magnetic strip in all parts of the core. (See Col. 4, lns. 18-23).

In contrast, independent claim 20 is amended to clarify the features of the present invention and calls for, among other things, the steps of impregnating each of the

annealed planar toroids and the annealed column-like toroids by a binding material, and attaching opposite butt-end surfaces of each of the column-like toroids to the a plate-like elements, respectfully, and arranging the column-like toroids in a spaced-apart parallel relationship, such as to form the magnetic circuit. In this manner, simple assembling and disassembling of the transformer can occur.

The present invention teaches annealing of the toroids of the magnetic core that are each formed by winding amorphous magnetic strips, and after impregnation of each of the column-like toroids, forming a radial slot extending along a height of the column-like toroid that is filled with an insulating material. Thus, the present invention advantageously allows for annealing completely manufactured magnetic cores, and eliminates any rewinding of the annealed strips to avoid undesirable effects caused by such rewinding.

Applicants respectfully suggest that in the outstanding Action, the rejections evidence "picking and choosing" features of various references and combining them when there is no suggestion in those references to do so. It is impermissible within the framework of a 35 U.S.C. §103 rejection to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one skilled in the art. Furthermore, obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. Teachings of references can be combined only if there is some suggestion or incentive to do so.

None of these references, whether cited or of record, taken either alone or in combination, disclose or suggest the invention as claimed.

Furthermore, none of the cited prior art references considered the problem faced and solved by the present inventor, that of readily dismantling and assembling of a transformer without causing and damage to the components of the transformer. The problem considered by the inventor must be considered in making a determination as to the obviousness of combining references. For these reasons, withdrawal of the rejection of amended claim 20 and its respective dependent claims 21-28 is respectfully requested.


New claims 29-31 are dependent upon claim 20, and recite further features of the present invention. More specifically, claim 29 recites that the annealing of each of the toroids is carried out in a magnetic field, and claim 30 recites that the temperature of the annealing process is up to about 550° Celsius. Claim 31 recites with respect to claim 20 that in step (iii) said annealed planar toroids are impregnated by a first binding material, and in step (vi) said annealed column-like toroids are impregnated by a second binding material. Applicants believe that these features are not disclosed or suggested by the cited references.

Applicants submit that in view of the above-identified amendments and remarks, the claims in their present form are patentably distinct over the art of record. Allowance of the rejected claims is respectfully requested. Should the Examiner discover

there are remaining issues which may be resolved by a telephone interview, he is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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